

WHAT IS CLAIMED IS:

1. A node for an optical network, comprising:  
at least one transport element operable to be coupled to the optical network,  
the transport element comprising an add/drop element comprising:
  - 5 a rejection filter operable to split an incoming signal that comprises traffic in a plurality of sub-bands into a first signal and a second signal, the first signal comprising the traffic in a first sub-band of traffic channels and the second signal comprising the traffic in the remaining sub-bands of traffic channels of the incoming signal;
  - 10 a bypass element operable to:  
receive the traffic in the first sub-band from the rejection filter;  
reject the traffic in a first portion of the first sub-band; and  
forward the traffic in a second portion of the first sub-band; and  
an add element operable to:  
15 receive the second signal from the rejection filter;  
receive the traffic in the second portion of the first sub-band from the bypass element; and  
combine the traffic in the second signal with the traffic in the second portion of the first sub-band for transport on the network.
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2. The node of Claim 1, wherein:  
the bypass element is further operable to:  
terminate the traffic in the rejected first portion of the first sub-band;  
receive add traffic in the first portion of the first sub-band; and  
25 combine the add traffic with the traffic in the second portion of the first sub-band; and  
the add element is further operable to:  
receive the combined traffic from the bypass element; and  
combine the traffic received from the bypass element with the traffic in  
30 the second signal for transport on the network.

3. The node of Claim 2, wherein the add/drop element further comprises a drop coupler operable to:

drop a first copy of the incoming signal for communication of at least a portion thereof to one or more clients of the node; and

5 forward a second copy of the incoming signal to the rejection filter.

4. The node of Claim 3, further comprising a distributing element comprising:

10 a splitter operable to make a plurality of copies of the first copy received from the drop coupler;

one or more filters each operable to receive one of the plurality of copies and to forward one or more wavelengths of the received copy; and

one or more transponders operable to receive each filtered wavelength from the one or more filters.

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5. The node of Claim 1, wherein the bypass element is operable to drop the traffic in the rejected first portion of the first sub-band for communication of at least a portion thereof to one or more clients of the node.

20 6. The node of Claim 5, wherein the add/drop element further comprises an add coupler operable to:

receive from the add element the combined traffic from the second signal and the second portion of the first sub-band;

receive add traffic in the first portion of the first sub-band; and

25 combine the add traffic and the traffic from the add element for transport on the network.

7. The node of Claim 5, further comprising a distributing element comprising:

a splitter operable to make a plurality of copies of the traffic in the first portion of the first sub-band received from the bypass element;

5 one or more filters each operable to receive one of the plurality of copies and to forward one or more wavelengths of the received copy; and

one or more transponders operable to receive each filtered wavelength from the one or more filters.

10 8. The node of Claim 1, wherein the first portion and the second portion of the first sub-band are two separate, continuous bands of wavelengths of the first sub-band.

9. The node of Claim 1, wherein the first portion and the second portion  
15 of the first sub-band are interleaved portions of the first sub-band.

10. The node of Claim 1, wherein the add element comprises a passive optical coupler.

20 11. The node of Claim 1, wherein the transport element further comprises a Raman amplification bypass comprising:

a first pump filter operable to:

separate Raman pump power from a traffic signal carried on the optical network;

25 forward the traffic signal to the add/drop element as the incoming signal; and

bypass the Raman pump power around the add/drop element; and

a second pump filter operable to receive the bypassed Raman pump power and combine the Raman pump power with a traffic signal forwarded from the add/drop  
30 element.

12. The node of Claim 11, wherein the Raman amplification bypass further comprises a Raman pump operable to add Raman pump power to amplify a particular portion of a sub-band of the traffic signal.

13. A method of transporting traffic on an optical ring, comprising:  
at one or more nodes coupled to the optical ring, splitting an incoming signal that comprises traffic in a plurality of sub-bands into a first signal and a second signal, the first signal comprising the traffic in a first sub-band of traffic channels and the  
5 second signal comprising the traffic in the remaining sub-bands of traffic channels of the incoming signal;  
receiving the traffic in the first sub-band at a bypass element;  
rejecting the traffic in a first portion of the first sub-band at the bypass element;  
10 forwarding the traffic in a second portion of the first sub-band at the bypass element; and  
combining the traffic in the second signal with the traffic in the second portion of the first sub-band for transport on the network.

14. The method of Claim 13, further comprising:  
terminating the traffic in the rejected first portion of the first sub-band at the bypass element;  
receiving add traffic in the first portion of the first sub-band at the bypass element;  
20 combining the add traffic in the first portion of the first sub-band with the traffic in the second portion of the first sub-band at the bypass element; and  
combining the add traffic in the first portion of the first sub-band and the traffic in the second portion of the first sub-band with the traffic in the second signal for transport on the network.

25 15. The method of Claim 13, further comprising dropping the traffic in the rejected first portion of the first sub-band at the bypass element for communication of at least a portion thereof to one or more clients of the associated node.

16. The method of Claim 13, wherein the first portion and the second portion of the first sub-band are two separate, continuous bands of wavelengths of the first sub-band.

5 17. The method of Claim 13, wherein the first portion and the second portion of the first sub-band are interleaved portions of the first sub-band.

18. The method of Claim 13, further comprising:  
at one or more nodes coupled to the optical ring, separating Raman pump  
10 power from a traffic signal carried on the optical network; and  
bypassing the Raman pump power around one or more components used to perform the steps of Claim 13.

19. The method of Claim 18, further comprising adding Raman pump  
15 power to the separated Raman pump power to amplify a particular portion of a sub-band of the traffic signal.

20. A node for an optical network, comprising:

means for splitting an incoming signal that comprises traffic in a plurality of sub-bands into a first signal and a second signal, the first signal comprising the traffic  
5 in a first sub-band of traffic channels and the second signal comprising the traffic in the remaining sub-bands of traffic channels of the incoming signal;

bypass means for receiving the traffic in the first sub-band, for rejecting the traffic in a first portion of the first sub-band at the bypass element, and for forwarding the traffic in a second portion of the first sub-band at the bypass element; and

10 means for combining the traffic in the second signal with the traffic in the second portion of the first sub-band for transport on the network.